

WHAT IS CLAIMED IS:

1. A method for demand breakout for a supply chain, comprising:
 - accessing memory storing:
 - a plurality of orders for at least one product, each product produced
 - 5 using at least one precursor;
 - a production schedule identifying one or more resources in the supply chain, a quantity of each product and precursor scheduled to be produced by the resources, and a time period associated with production of each product and precursor;
- 10 using one or more processors:
 - identifying one or more particular units of the product that correspond to each product order; and
 - identifying one or more particular units of one or more precursors that correspond to each product order.
- 15 2. The method of Claim 1, wherein identifying one or more particular units of one or more precursors comprises generating a first event for each product order, the first event comprising a request for a specified quantity of a specified item.
- 20 3. The method of Claim 2, further comprising, using the one or more processors, executing the first event to generate at least one second event comprising a reservation of a specified quantity of a specified precursor used to produce the item requested by the first event.
- 25 4. The method of Claim 3, wherein the second event is associated with a flow that represents at least the specified quantity of the specified precursor arriving at one of the resources.

5. The method of Claim 2, wherein:
a plurality of flows representing at least one precursor are associated with a resource; and
the method further comprises, using the one or more processors:
 - 5 determining a specified quantity of a specified precursor using the first event;
 - identifying one or more of the flows that represent the specified precursor; and
 - generating at least one second event associated with at least one of the 10 identified flows.
6. The method of Claim 5, wherein generating at least one second event comprises:
 - generating a single second event associated with one flow if that flow 15 represents at least the specified quantity of the specified precursor; and
 - generating a plurality of second events associated with a plurality of flows if none of the flows represent at least the specified quantity of the specified precursor.
7. The method of Claim 2, wherein:
 - 20 at least one of the precursors needed to produce the item requested by the first event is too scarce to produce the specified quantity of the specified item; and
the method further comprises, using the one or more processors:
 - identifying the precursor that is most scarce using a bill of materials table;
 - 25 determining a fractional quantity of the specified item that can be produced using the most scarce precursor; and
determining a fractional quantity of each precursor needed to produce the fractional quantity of the specified item.

8. The method of Claim 7, wherein:
the specified item may be produced according to a plurality of bill of materials tables; and
the method further comprises, using the one or more processors, identifying
5 the bill of materials table that results in the production of the largest quantity of the specified item.

9. The method of Claim 2, wherein:
the first events comprise a first layer of a tree; and
10 the method further comprises, using the one or more processors:
executing the first events to generate at least one second event; and
executing the second event to generate at least one additional first event in a second layer of the tree.

- 15 10. The method of Claim 9, wherein the first and second events may be propagated through the layers of the tree to allocate one or more particular units of one or more precursors to the product orders.

11. The method of Claim 2, further comprising, using the one or more
20 processors:
ranking the first events; and
executing the first events according to their rank.

12. The method of Claim 11, wherein ranking the first events comprises:
25 generating a weighted average for each of the first events, each first event associated with a plurality of attributes and an attribute value corresponding to each attribute, each attribute associated with a weight, the weighted average based on the attribute values and the attribute weights; and
ordering the first events by decreasing weighted average.

13. A system for demand breakout for a supply chain, comprising:
memory operable to store:
a plurality of orders for at least one product, each product produced
using at least one precursor; and
5 a production schedule identifying one or more resources in the supply
chain, a quantity of each product and precursor scheduled to be produced by the
resources, and a time period associated with production of each product and
precursor; and
one or more processors collectively operable to:
10 identify one or more particular units of the product that correspond to
each product order; and
identify one or more particular units of one or more precursors that
correspond to each product order.

15 14. The system of Claim 13, wherein the one or more processors are
operable to identify one or more particular units of one or more precursors by
generating a first event for each product order, the first event comprising a request for
a specified quantity of a specified item.

20 15. The system of Claim 14, wherein the one or more processors are
further operable to execute the first event to generate at least one second event, the
second event comprising a reservation of a specified quantity of a specified precursor
used to produce the item requested by the first event.

25 16. The system of Claim 15, wherein the second event is associated with a
flow that represents at least the specified quantity of the specified precursor arriving
at one of the resources.

17. The system of Claim 14, wherein:

a plurality of flows representing at least one precursor are associated with a resource; and

the one or more processors are further operable to execute the first event by:

5 determining the specified quantity of the specified precursor using the first event;

identifying one or more of the flows that represent the specified precursor; and

10 generating at least one second event associated with at least one of the identified flows.

18. The system of Claim 14, wherein:

at least one of the precursors needed to produce the item requested by the first event is too scarce to produce the specified quantity of the specified item; and

15 the one or more processors are further operable to:

identify the precursor that is most scarce using a bill of materials table;

determine a fractional quantity of the specified item that can be produced using the most scarce precursor; and

20 determine a fractional quantity of each precursor needed to produce the fractional quantity of the specified item.

19. The system of Claim 18, wherein:

the specified item may be produced according to a plurality of bill of materials tables; and

25 the one or more processors are further operable to identify the bill of materials table that results in the production of the largest quantity of the specified item.

20. The system of Claim 14, wherein:

the first events comprise a first layer of a tree; and

30 the one or more processors are further operable to:

execute the first events to generate at least one second event; and

execute the second event to generate at least one additional first event in a second layer of the tree.

21. The system of Claim 20, wherein the first and second events may be propagated through the layers of the tree to allocate one or more particular units of one or more precursors to the product orders.

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22. The system of Claim 14, wherein the one or more processors are further operable to:

10 generate a weighted average for each of the first events;
rank the first events according to their weighted average; and
execute the first events based on the rank of the events.

23. A method for demand breakout for a supply chain, comprising:
accessing memory storing:
a plurality of orders for at least one product, each product produced
using at least one precursor;

5 a production schedule identifying one or more resources in the supply
chain, a quantity of each product and precursor scheduled to be produced by the
resources, and a time period associated with production of each product and
precursor;

using one or more processors:
10 generating a first event for each product order, the first event
comprising a request for a specified quantity of a specified item, the first events
forming a first layer in a tree;
generating a weighted average for each of the first events, each first
event associated with a plurality of attributes and an attribute value corresponding to
15 each attribute, each attribute associated with a weight, the weighted average based on
the attribute values and the attribute weights;

executing the first events in order of decreasing weighted average by:
determining a specified quantity of one or more specified
20 precursors needed to produce the specified quantity of the item requested by the first
event;
determining if at least one of the precursors needed to produce
the item requested by the first event is too scarce to produce the specified quantity of
the item;

determining a fractional quantity of each specified precursor if
25 at least one of the precursors is too scarce; and
generating at least one second event for each of the specified
precursors, the second event comprising a reservation of one of the specified quantity
of the specified precursor or the fractional quantity of the specified precursor;

executing the second events to produce one or more additional first
30 events in a second layer of the tree; and
propagating the first and second events through any additional layers
of the tree to allocate one or more particular units of one or more precursors to each
product order.

24. A system for demand breakout for a supply chain, comprising:
memory operable to store:
a plurality of orders for at least one product, each product produced
5 using at least one precursor;
a production schedule identifying one or more resources in the supply
chain, a quantity of each product and precursor scheduled to be produced by the
resources, and a time period associated with production of each product and
precursor; and

10 one or more processors collectively operable to:
generate a first event for each product order, the first event comprising
a request for a specified quantity of a specified item, the first events forming a first
layer in a tree;
generate a weighted average for each of the first events, each first
15 event associated with a plurality of attributes and an attribute value corresponding to
each attribute, each attribute associated with a weight, the weighted average based on
the attribute values and the attribute weights;
execute the first events in order of decreasing weighted average by
determining a specified quantity of one or more precursors needed to produce the
20 specified quantity of the item requested by the first event, determining if at least one
of the precursors needed to produce the item requested by the first event is too scarce
to produce the specified quantity of the item, determining a fractional quantity of each
precursor if at least one of the precursors is too scarce, and generating at least one
25 second event for each of the precursors, the second event comprising a reservation of
one of the specified quantity of a specified precursor or the fractional quantity of the
specified precursor;
execute the second events to produce one or more additional first
events in a second layer of the tree; and
propagate the first and second events through any additional layers of
30 the tree to allocate one or more particular units of one or more precursors to each
product order.